Raising India's Relevance in the Semiconductor Industry

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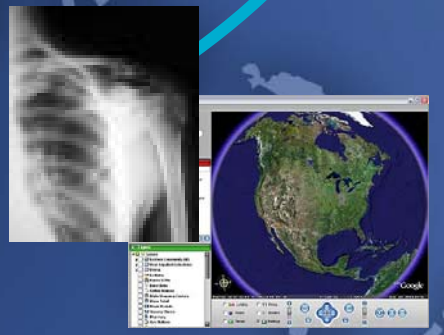
President & CEO
Jan 2009

LSI Corporation

LSI Mission: To be the most trusted provider of technologies that connect people and information

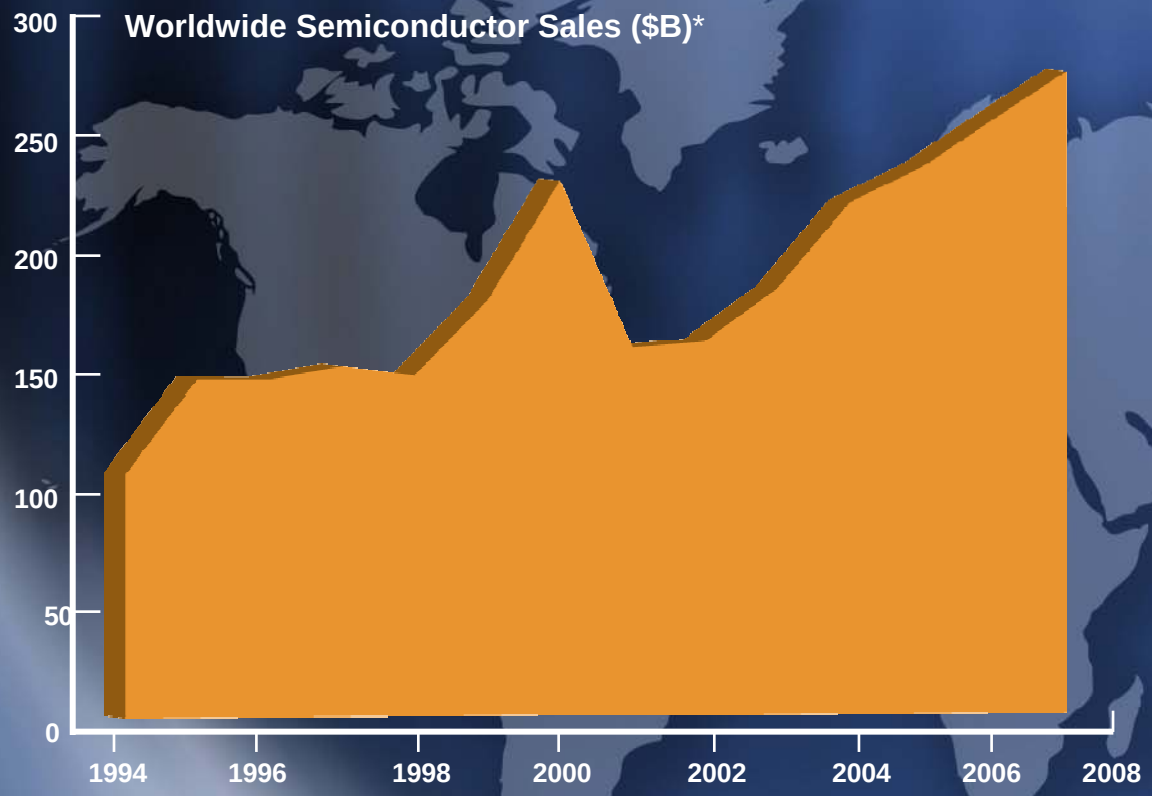


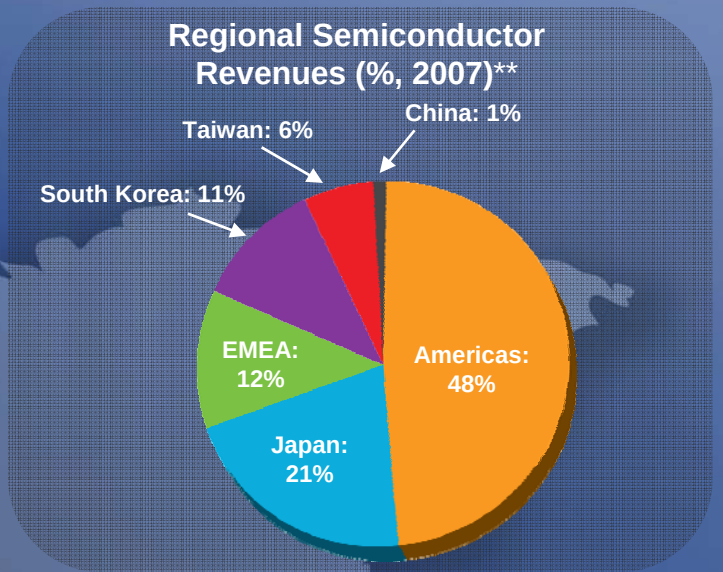
Key Messages

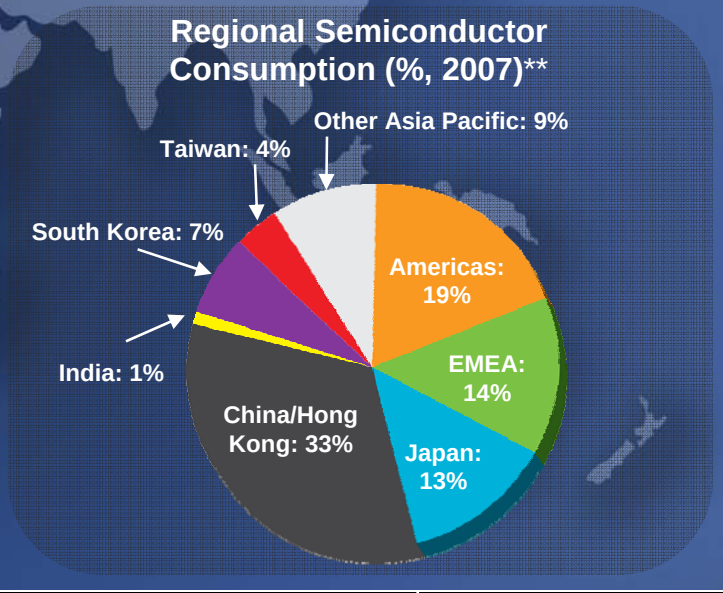
- The worldwide semiconductor industry is $250B+ and growing
- Market forces over time have driven structural changes creating sub-industries and many new opportunities
- India has benefited through increasing participation and growing contribution over the past 10 years
- India possesses a unique combination of intrinsic enablers that can greatly elevate its role into the future

India Must Cultivate These Enablers

Semiconductor Industry Growth







*Global Semiconductor Association, Dec 2008

**Gartner WW Semiconductor Forecast, Nov 2008

Transformation → New Opportunities, Industries, & Players

Vertically Integrated Companies

- Assembly, Test & Fulfillment
- Backend Productization
- Chip Design
- Circuit Design/IP Development
- Design Tools
- Si Technology & Manufacturing

1980s to Early 1990s

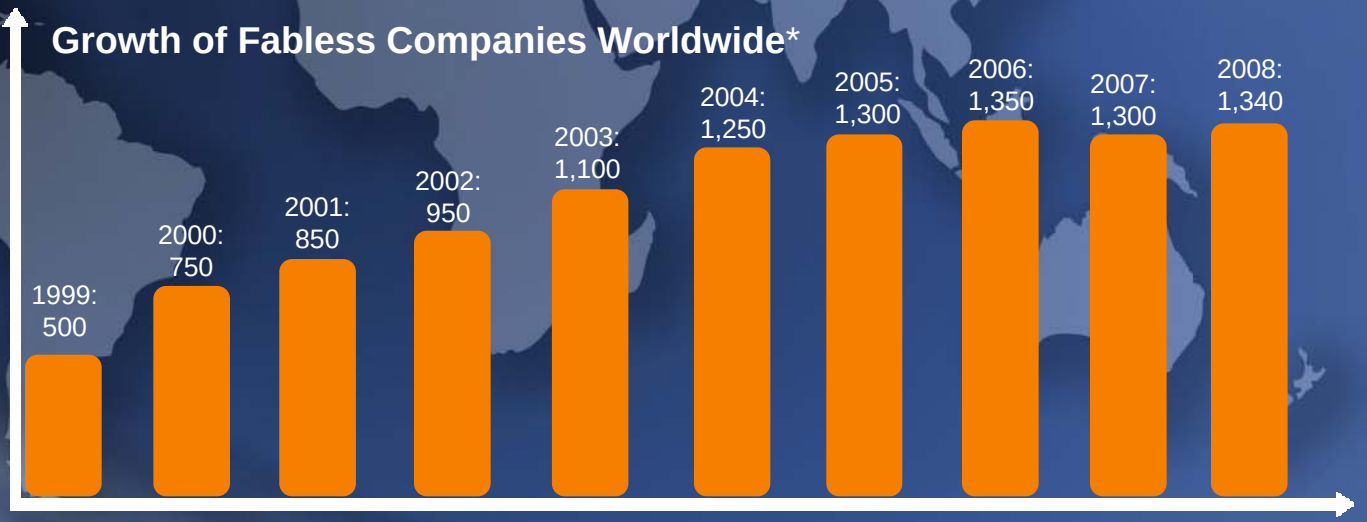
Competition
Economics
Standardization
Talent Access
Market Access

A Horizontal Industry

- Off Shoring
- Vertically Integrated Co's

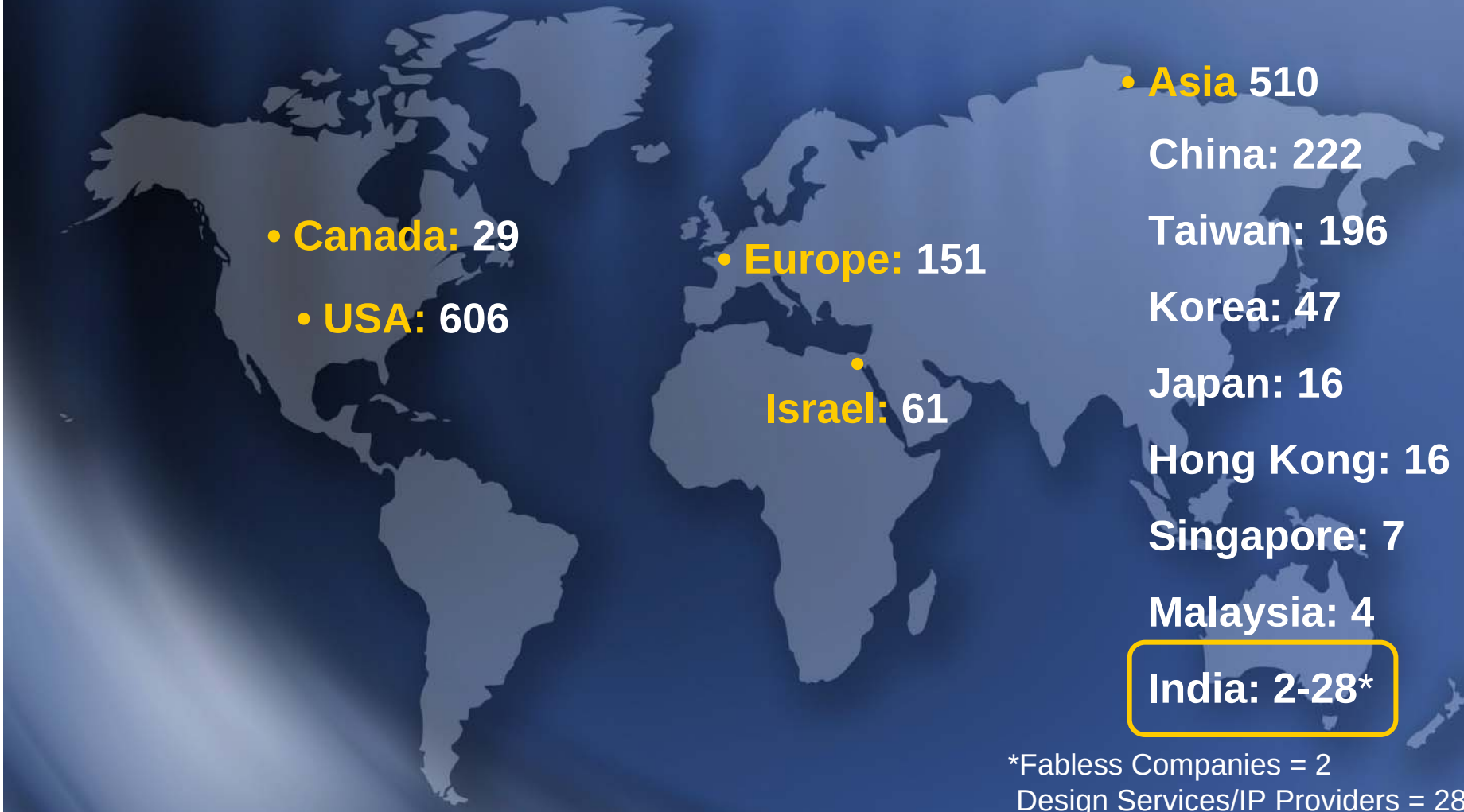
Late 1990s to 2000s

Dawn of Foundries → Dawn of Fabless IC Companies



*Global Semiconductor Association, Dec 2008

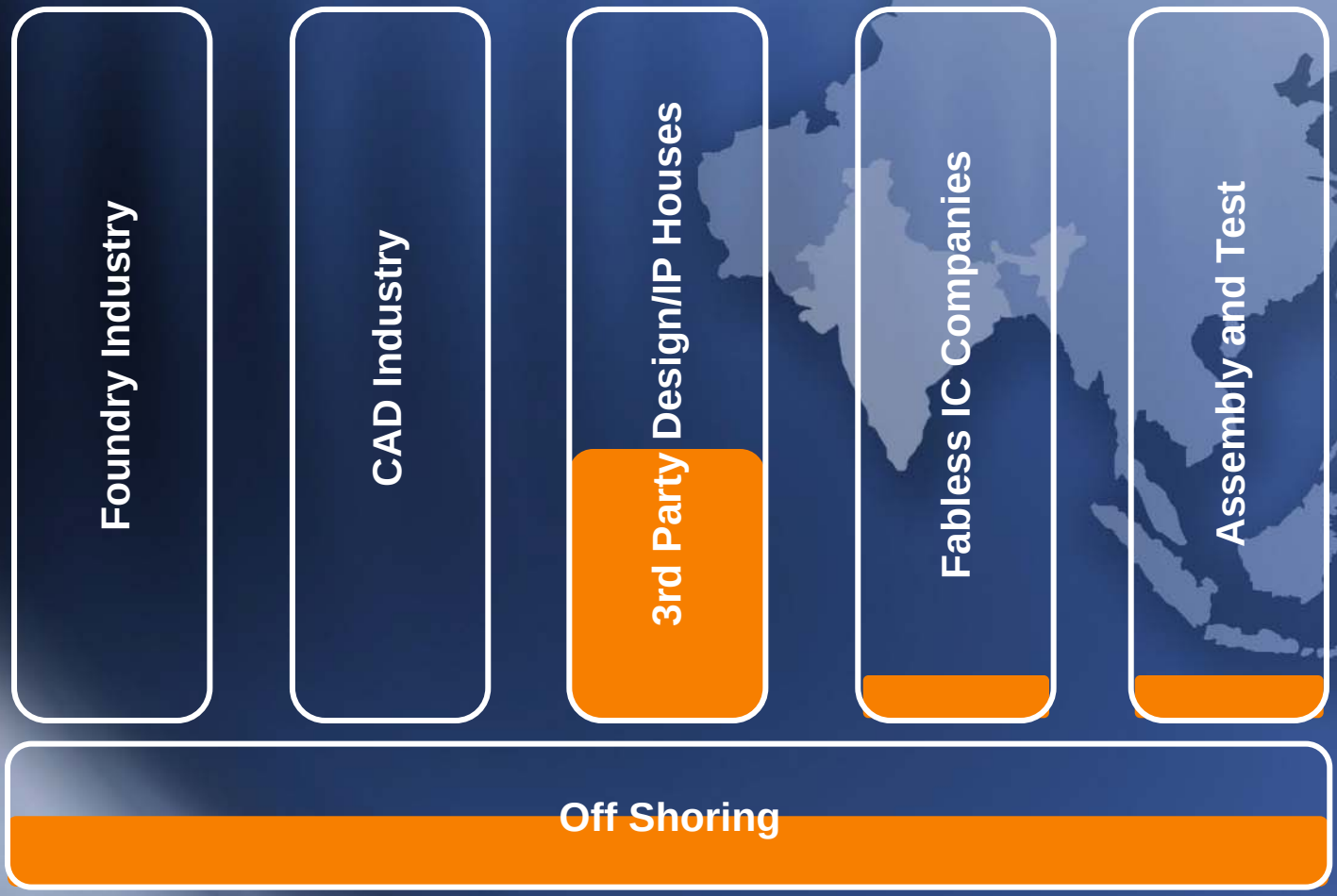
Worldwide Distribution of Fabless IC Companies



- Canada: 29
- USA: 606
- Europe: 151
- Israel: 61
- Asia 510
  - China: 222
  - Taiwan: 196
  - Korea: 47
  - Japan: 16
  - Hong Kong: 16
  - Singapore: 7
  - Malaysia: 4
  - India: 2-28*

*Fabless Companies = 2
Design Services/IP Providers = 28

India Growing in Participation



India Growing in Participation

Revenues for VLSI, Board Design and Embedded Software, 2007-2010*

Workforce for VLSI, Board Design and Embedded Software, 2007-2010*

*ISA-IDC Report 2008: India Semiconductor and Embedded Design Service Industry

LSI India Growth in Numbers and Capability

Necessary Enablers to Grow India's Relevance

	China	Taiwan	Korea	Japan	India
Cost of Talent	1	2	2	3	1
Market Potential	1	3	3	2	1
Diversity & Scalability	1	2	2	2	1+
Language	2	2	2	2	1
Anchor	Systems Mfg.	ODMs, Foundries	Mfg., Memories	Consumer Electronics	Software

High quality, scalable & cost effective talent

Emergence of sizable local market

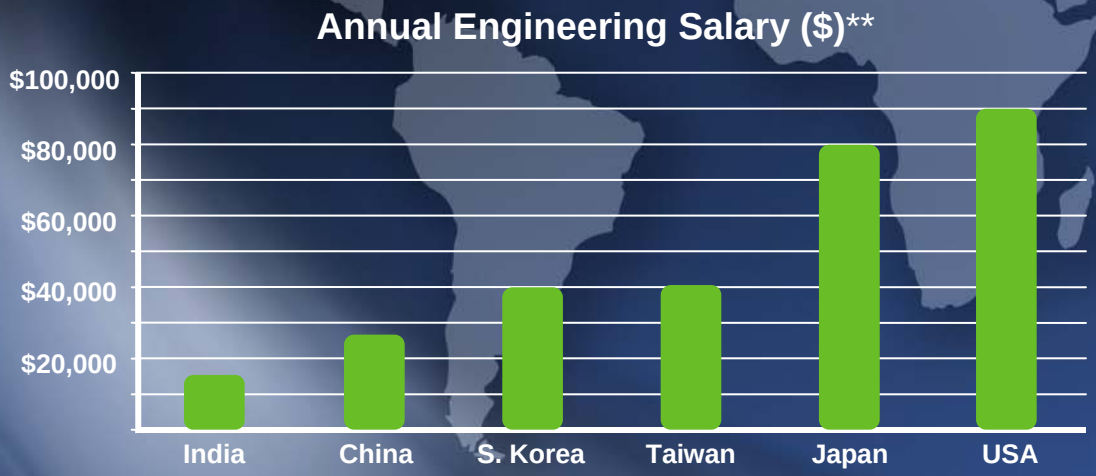
Local presence of systems companies

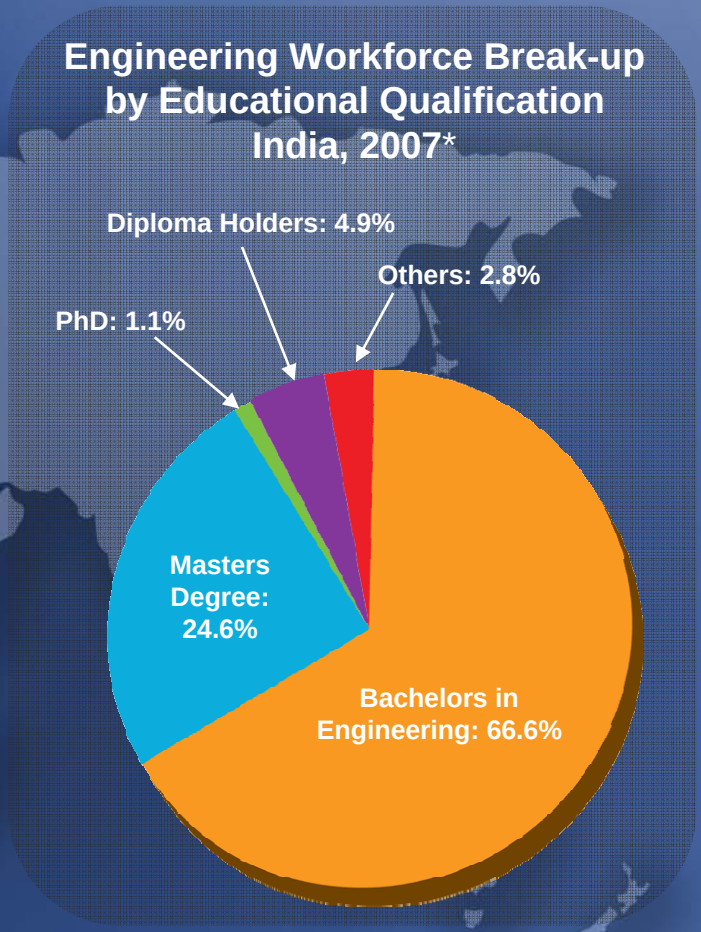
Culture of innovation

Talent is Key Ingredient for Growth

- Availability
- Scalability
- Relevance
- Quality
- Cost
- Retention

India Compares Favorably in Availability of Talent





*ISA - Ernst & Yong Benchmarking Study: India in the Global Semi Design Ecosystem, Feb 2007

**Radford Benchmark and International Survey 2007

Nurturing Talent is a Collective Responsibility

Industry

- Grow India's end-to-end capability
- Dedicated in-house training
- Build strong pipelines: University collaborations/sponsorships/internships

Academia

- Build relevant university curriculum
- Facilitate labs and training facilities
- Incentivise faculty

Growing GDP Offering an Attractive Local Market

Consumer Electronics

- Growing per capita income
- Rise in household spending

Communications Equipment

- Telecom services - mobile and fixed line
- SPs investing in building infrastructure
- Deregulation of satellite/cable industry

Data Processing Hardware

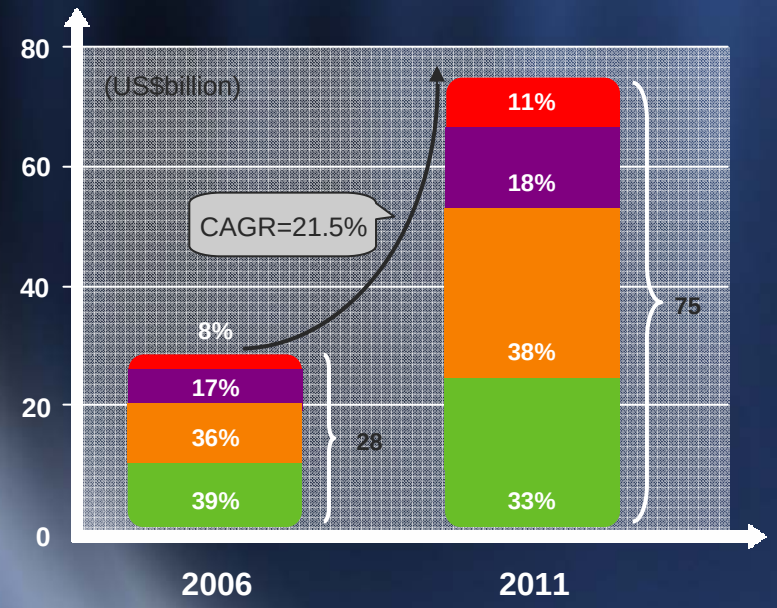
- Growing popularity of PCs
- Affordability is the key

Automotive/Industrial

- Automotive: Emissions and Safety
- Industrial: Mfg Systems and Medical Equip.

Rapid Growth Expected in Semiconductor Consumption

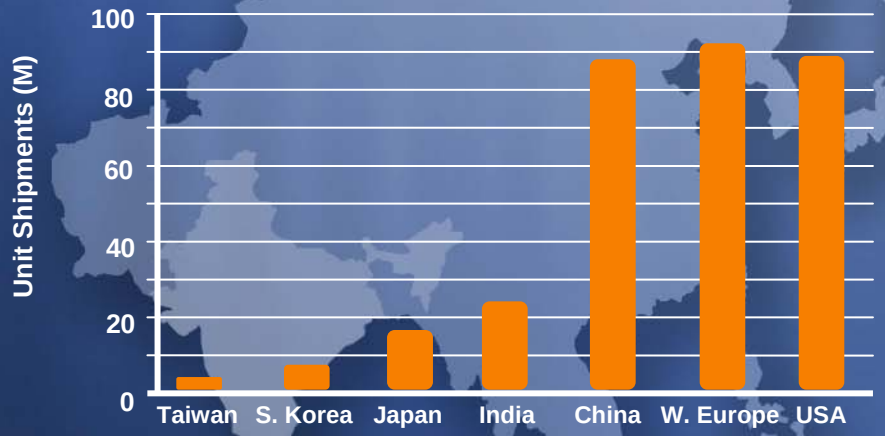
Share of Total Electronics Demand by Application Category, India, 2006 and 2011*



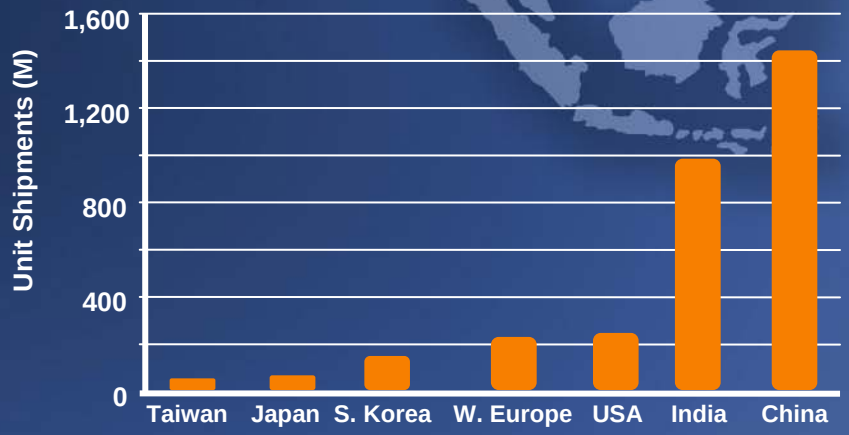
Other electronics*
Communication electronics
Data processing electronics
Consumer electronics

- Includes industrial, automotive and military/civil aerospace products
- CAGR=compound annual growth rate

PC Unit Shipments Comparison (2012)**



Mobile Handset Unit Shipments Comparison (2012)***



*Dataquest Insight: Demand for Electronic Equipment, India: 2006-2011, August 2007
**Gartner Dataquest Market Statistics: Forecast PCs, September 2008
***Gartner Dataquest Market Statistics: Forecast Mobile Handsets, September 2008

Increasing Local Investments by Systems Companies

Manufacturing Investments by Top Global OEMs*

Products	TVs (analog, CRT), home appliances	Mobile phones	Mobile phones, set-top boxes	Mobile switching equipment, BTS	Mobile phones, bases stations, TV LCDs, DVD players	Mobile phones, Telecom equipment, Color TVs, appliances, monitors, Desktop PCs, laptops, Broadband, WiMAX, 3G equipment, BS	WLAN/Wireless infrastructure, Internet protocol (IP) phones
OEM	LG Life's Good	SAMSUNG	MOTOROLA	ERICSSON	LG Life's Good, NOKIA	MOTOROLA, SAMSUNG, SIEMENS, DELL, HP, Alcatel-Lucent	Nokia Siemens Networks, CISCO
Investment ($million)	20	15	10	150	210	515	200
	2002	2003	2004	2005	2006	2007	2008

*Market Trends: India's Twin Benefits for Global EMS Vendors, Gartner Report August 2007

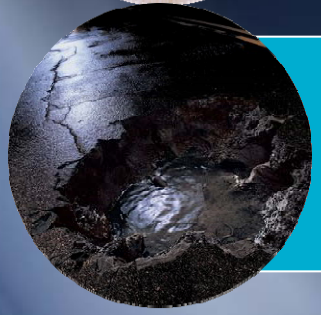
Challenges Remain to Large Scale OEM Investments

Weak Supply Base of Other Components

- Not cost effective to import
- Complex customs and import duties
- Weak logistics infrastructure

Limited Market Size

- Lack of scale
- Must provide value added services



Weak Infrastructure and Logistics Facilities

- Power, water, transportation networks

India Must Extend Innovation to Product Development

Patents Applied For and Granted by Country (2001-2005)*

	China	Taiwan	Israel	Czech Rep.	UK	Canada	USA	India
Total Patent Applications	4,700	22,278	6,656	18	15,942	12,529	596,447	2,145
Total Patents Granted	1,220	9,333	1,997	46	4,501	3,559	234,725	621

- Increasing system level know how will enable greater innovation
- There must be a commitment to invest in basic research
- Innovation is cultural, great minds will generate great ideas

*ISA- Ernst & Yong Benchmarking Study: India in the Global Semi Design Ecosystem, Feb 2007

Ideas are the Source of Growth…

1876: First Telephone

1948: Information Theory

2007: Industry's First 65nm Iterative Decoding Read Channels

1999: Raman Amplifier Created

1969: Developed UNIX Operating System

1958: Patent on Laser

1979: First Digital Signal Processor (DSP)

1960: First SCSI Protocol chip

1989: First All-ASIC Workstation

1926: Sound Movies

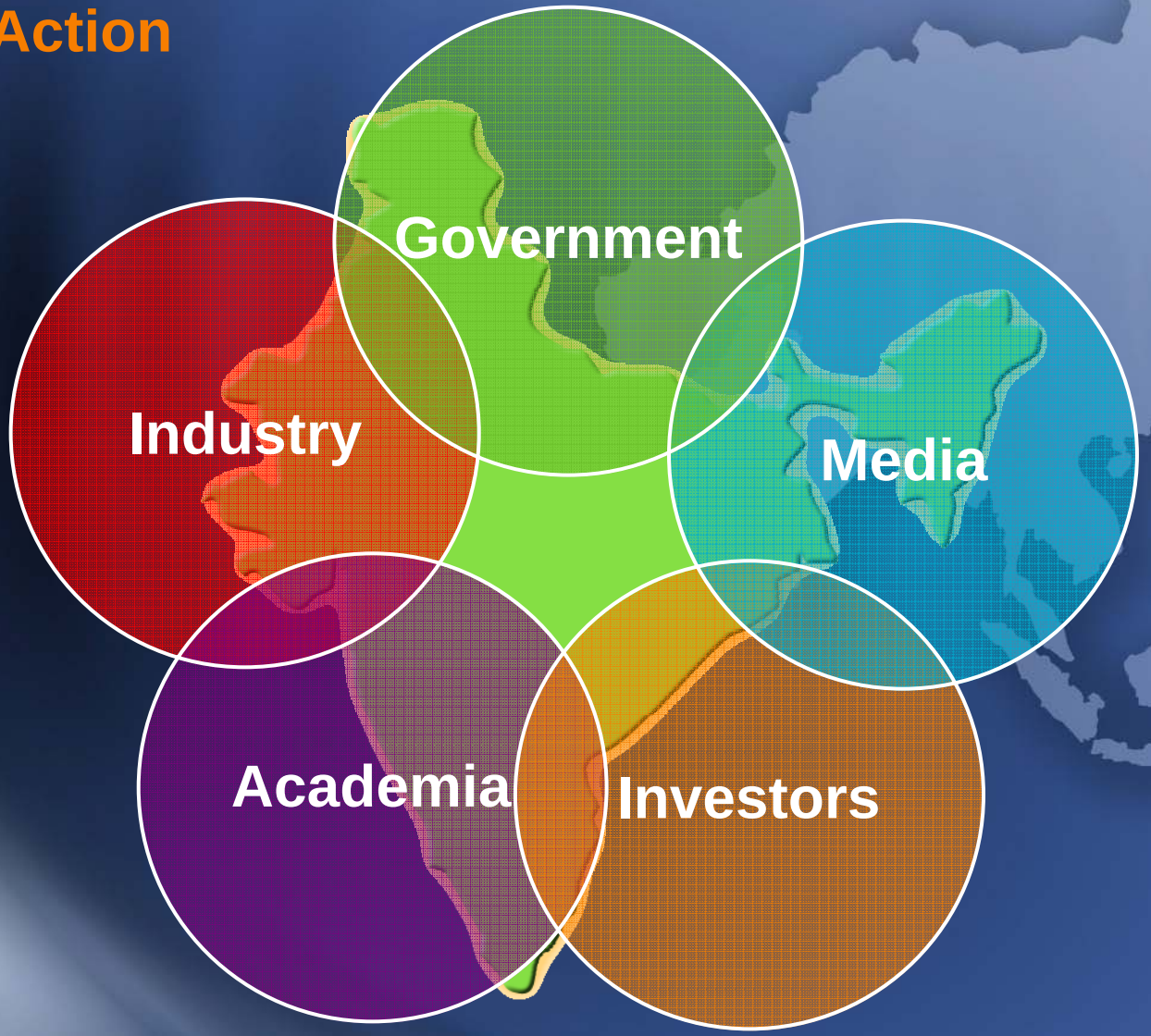
1947: Developed First Transistor

2004: Industry's First Serial Attached SCSI (SAS) Controller IC

1994: Sony PlayStation Introduced Using LSI Technology

1954: Solar Battery Cell

Call To Action



Thank You !